

MODELING IN CLAY.



VAGO — PITMAN.

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Instructions in the art of modeling in c



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INSTRUCTIONS
IN THE ART OF
MODELING IN CLAY.

BY A. L. VAGO.

WITH AN APPENDIX
ON
MODELING FOLIAGE, ETC.

BY BENN PITMAN,
Of Cincinnati School of Design.

CINCINNATI:
ROBERT CLARKE & CO.

1880.
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PREFACE.

FROM having been frequently asked for a Book of Instructions in the Art of Modeling, and being unaware of the existence of any thing of the kind, I have presumed to furnish the information contained in the following pages, as being likely to supply what appears to me to be an increasing want, now that the world is growing wise enough to appreciate the fact that the mind is improved and refined by the classical turn which it receives from being engaged in such an art. To this may be added the advantage arising from the fact, that by thus employing our leisure time, many of us are weaned from such courses as tend to lighten the pocket and impair the health. It should be known, too, that, by practicing in the arts of either drawing, painting, or modeling, merely as a sort of pastime, many of the intellectual faculties

acquire an acuteness which can not fail to be of advantage in every pursuit, whether of a literary, commercial, or mechanical character.

In thus undertaking to give instructions in the art of modeling, namely, by means of a book, I feel that I have engaged myself to a task by no means easy to accomplish. I may say here what at the same time will be well for the pupil to know, that one practical lesson in an artist's studio is more useful to the learner than a dozen books full of theory. It is easy enough to read in a book that a mountain can be removed by shovelfuls, but to accomplish such a thing practically requires much steady and untiring perseverance.

I do not know that it is different in other arts, but in modeling the pupil will find that he will not become master of the art merely by looking to see what the book says. By attending to what is herein advised, the pupil will learn how to set to work, which is somewhat desirable to know, as from setting out without any previous knowledge, the wrong way is mostly adopted, and the difficulty arising therefrom is apt to tire, and disgust, and to discourage from any further attempt after

the first failure. It is probably owing to this that the false notion is generally accepted, that "artists must be born;" and as such an error is apt, in some cases, to deter many from making trial of their abilities, such a fallacy should be quashed. With this object in view, I venture to say that no one can boast of a proficiency in any art that was not acquired by long and patient application. So much, then, for "born artists." It is certainly true that some persons are naturally of weaker perception than others; for, while some persons can form a very correct estimate of dimensions and proportions by the eye alone, others dare not trust themselves without rule or measure. But even those of weak perception should not be deterred trying their hand at modeling on that account; in fact, I would recommend persons to engage in the art for that very reason, since nothing could serve better to develop the perception and correct the judgment. Hence the advantage of the "Kindergarten" system of teaching children, wherein modeling is included, by which knowledge is imparted not only through the ear, but also through the eye, and even the finger-ends.

Those who feel diffident about producing any thing worth while the trying, may take courage from the distorted forms that fill the market in Parian ware. It should be known that all productions in Parian ware shrink about one-fifth in the "firing," and previous to undergoing this process many of them warp, and what were intended to represent classical subjects often assume very grotesque shapes. Hence the preference, with a correct taste, for plaster casts to Parian ware.

In modeling, it is not always those who start with the best judgment that become the most successful in the art; for often when the eye is in advance of the hand, the "attempt," though even good for the "start," not being equal to what is desired, the tools are cast aside, and the matter ended. Those void of such qualifications as constitute the connoisseur are often charmed by the first effort, and thereby encouraged to go on again and improve as they go. It was my own experience to be so delighted with my first attempt that I thought there was nothing equal to it in this world; in fact, I prized it so much that, as the phrase goes, I "wrapped it up in lavender," that

is, I stowed it carefully away. I went on dabbling occasionally in the clay, and forgot all about my original model. Some long time afterward, while searching for something else, I came across a package, and, being curious to know what it contained, I opened it, and beheld my much treasured model with a feeling of disgust, then as strong as my delight was great at the first. It was, of course, "disposed of under the hammer;" and this I acknowledge without shame, knowing, as I do, that the works of even great masters have sometimes been similarly subjected.

I feel thankful, however, that, as an amateur, I was not too wise for myself, as, like some critics whose knowledge is not founded upon experience, I might have known wonders and have remained too clumsy to snuff a candle without putting out the light.

I feel greatly inclined to believe that every teacher of music has experienced much the same thing with regard to the musical faculty, namely, that those pupils having a quick ear for music are most reluctant to go through the ordeal of learning to perform on an instrument, because they can

not endure the jarring sounds which frequently occur from mistakes while practicing; whereas, those less sensitive in this respect go through their exercises more willingly, and become proficient soonest. From these instances, it will be seen that any scruple arising from fear of failure should be abandoned; while the idea of "born artists" must appear as ridiculous as that of born washerwomen.

In the preceding and what is to follow, I hope that I shall not be found guilty of having trespassed upon territory belonging exclusively to that class represented by Messrs. Moore and Burgess, who may with impunity propose as facts worthy the serious consideration of the Darwinite—that pigs lay eggs and that sausages grow on trees.

That the object of this preliminary be not missed, I may add in concluding it that patience and perseverance will do much to develop, where latent, those faculties so necessary to the proper comprehension of such subjects as engage us in the affairs of daily life. Although, as a fact, no kind of training will produce faculties, yet, on this account, we may not claim the excuse of being

deficient, for, excepting in cases of idiocy, it is as unusual for a person to lack any one of the natural faculties as it is to see a face without a nose. The prospect, therefore, is clear to all who may wish to improve themselves, as far as it is possible to do so, by engaging in modeling, while success in the art will be in proportion to the diligence of the pupil.

A. L. VAGO.

INSTRUCTIONS IN THE ART OF MODELING IN CLAY.

WHAT TO PROVIDE AND HOW TO BEGIN.

CLAY is the material generally used in modeling. That of the lightest color is preferable, as dark clay obscures the shadows by which form is, to a certain extent, rendered distinguishable. If the clay be *dry* and *hard* when procured, it should be broken into small pieces and sprinkled with clean water. It should then be left to soak and occasionally stirred about, so that it be moistened evenly throughout. It is possible to have the clay too stiff, as also too wet, to work it easily. When too dry or stiff add a little more water, and if too flabby and wet add a little dry clay, finely powdered. It should then be well kneaded; this should be done by the person who is going to use the clay, as thereby the hands will become

used to its nature, and the ability to manipulate it facilitated.

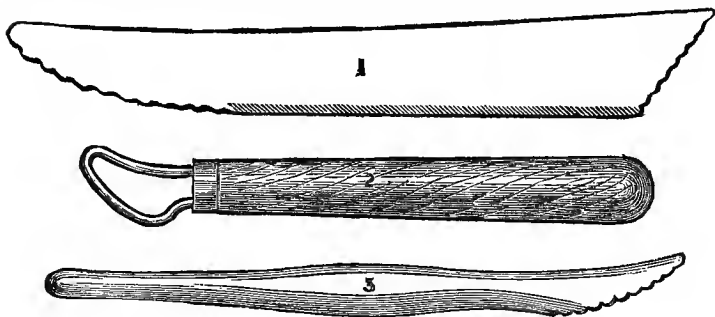
It is advisable to begin not on too large nor on too small a scale, nor on any difficult or intricate subject; neither should the novice attempt to model any thing "out of his own head." Some common object should be chosen to copy from; say an old boot, to begin with, as this may be started on a flat piece of wood, and will not need interior props to support the clay: although a peg driven into the flat board will prevent the clay from slipping off.

In beginning to model do not squeeze the clay into form in the hands, but lay it on the flat board, and gradually build it up until it assumes the form of the object being copied. Before introducing any detail see that the proportions are tolerably correct. It is of the greatest importance to attend to the contour previous to putting in the finishing strokes, as where it is attempted to finish from the beginning it is likely to be found, on making a general survey, that the work on the whole is out of proportion. To correct work that has been once finished frequently necessitates much remod-

eling, unless the alteration can be effected by cutting out or letting in a wedge of clay, as the case may need.

TOOLS.

With regard to tools, much may be accomplished with the fingers, although there are three kinds in



particular without which the progress of the pupil can not but be slow. These are represented in the annexed cuts. That numbered (1) is used for roughing out, (2) for reducing and making grooves, and (3) for giving the finishing touches. With this tool numbered 3, the small end of which resembles the bowl of a spoon, more work may be done in one hour, and with better effect, than could be accomplished in three hours with a tool of any other shape.

The old boot, when attempted, will enable the pupil to understand better how to use these tools than words can inform. The tendency of the clay to slip or shift from its base will suggest the necessity of inserting pegs, by means of which the clay may be secured to the board. When the work is left unfinished, it should be carefully wrapped around with wet cloths, for when left not thus covered up, the clay is apt to get dry and inflexible. When this should happen, an occasional sprinkling with water will restore its pliancy—a brush will serve best for this purpose. A glass shade placed over the model so as to exclude the air answers better to keep the clay moist than wet cloths. When the model is too large for a shade, a piece of oiled cloth laid over it may answer to prevent its moisture from evaporating.

The old boot, or whatever other object may be chosen, is intended to give the “prentice han’” something of dexterity in managing the clay, rather than for producing something for its sake. Although there may be no desire to set any great store by the first production, yet it is advisable to bestow as much care and attention upon it as if it

were intended to be sent to the Royal Academy for exhibition; for the more proficient the hand is made by the first piece of work, the greater will be the ease of accomplishing the second.

When the model is finished, it will be well to invite a friend or several friends to inspect it, as defects are thus often detected which have been overlooked by the person engaged on the work. A person need not be a Royal Academician to be able sometimes to make suggestions which may be of advantage to the artist. A painter, while engaged on some pigs at a farm-house, was told by the crow-boy that "the picter is n't nat'ral, for I never see'd three pigs feeding together without one at least of them had his foot in the trough." When a fault is pointed out in this manner, and it appears evident to the artist, it is advisable to correct it. A little discretion should be used, however, even with regard to the criticisms of our friends, as otherwise we may fare the fate of the man who led the donkey, then rode the donkey, next carried the donkey, and got laughed at in the end, all from following the advice of several kindly disposed persons.

Should the old boot be adopted as a copy to work from, it should be filled with paper or whatever else may serve to fix its shape, for if this gets altered after the model is begun, it will give the trouble of altering the model to the last shape. On this account there is a disadvantage in working from a flexible copy, though in some cases it might be considered convenient on the same account, since it admits of being twisted to suit the model where it is wished to avoid the trouble of working the model up to the original shape of the copy. The moral to this kind of deception is, that the cheat alone gets cheated. The business of the pupil is to reproduce his copy faithfully, and not to cheat himself out of that practice intended to advance him to a class which should be above such chicanery.

Having faithfully executed his initiatory model, the pupil will have learned how to work the clay and how to ply the tools. The next object chosen should still be neither too large nor too small, and the copy should be done nearly as possible the same size as the object being copied. This will admit of testing the proportions by

means of calipers or compasses. It is better to work without using these until after the building up and roughing out is done, purposely to quicken the judgment with regard to dimensions and proportions, and then to correct by measuring before finishing off. It will be easy to take from where there is too much, and to add where necessary.

At this stage I would recommend a plaster cast of the mouth for the next study. This should be worked upon until it is accurately copied, even if it should take one hour's working daily for one month. Then a cast of the eye should be copied; after which a cast of the ear. Those of classical shape are preferable. It is advisable not to go from one to the other until the first has been well copied.

The pupil may now choose such subjects as may be most agreeable to the inclination. If there be a preference for architectural modeling, a boss, not too elaborate, will make a good subject to start with. In the same way of basso-relievo, or modeling in low relief. But this branch of the art, in some cases, conjoins that of the painter, wherein it is necessary to observe the rules of perspective,

where figures in the foreground are represented larger than those which appear in the distance.

I do not know whether any rule is recognized among painters which may direct the pupil with regard to perspective other than that of watching his work at such distance as it is intended to be viewed from by the spectator, where the eye affords the only guide. This method of reviewing the work at a distance may be employed with advantage in every instance, during the roughing out, as thereby the general effect is brought under notice, which is of much more importance than fine finish.

THE FACE.

If the desire be to excel in modeling busts, the next best study is a cast of the face of the Venus di Milo (Fig. 4): copies of this can be easily obtained. This will be quite sufficient to test the patience of the pupil; for in this study is some hair which should be copied, first the mass, and then the minutæ. The hair, which might be considered but as a minor point, will, in practice, be found most difficult to treat; but by diligence it may be mastered. The mask of St. Jerome, by Michael An-

gelo, is the next best study. In this cast the beard is represented in masses, and not by fine lines. Where it is possible, it is better to represent hair by masses or tufts, than by lines, which give a harsh or hard effect, rather than that of wavy softness (Fig. 5).

Fig. 4.



MASK, VENUS DI MILO.

Fig. 5.



MASK, ST. JEROME BY MICHAEL ANGELO.

It is of the greatest importance to copy correctly the contour and inequalities of the head, at least equally so as those of the face. Where the head is represented short in proportion to the face,

the bust is apt to be regarded as that of a malefactor. In the illustrations which frequently appear in *Punch*, malign characters are represented as such with more force by a shortness of the head. It is not necessary to *believe* in the *principles* of phrenology, but an observance of them in modeling busts will materially assist the artist. The geography of the head, as furnished by the phrenological divisions, supplies landmarks whereby the ground can be reconnoitered with precision.

EXPRESSION OF CHARACTER.

It may be taken for what it is worth ; but if the pupil can not appreciate the fact that the head and face are indicative of character, he will be insensible to the chief charm in modeling busts, and he had better turn at once to still life, where it is not attempted to make "art stand substitute for nature," by giving to the clay a living form, that is, an expression of life and character.*

French artists, who do not hesitate to recog-

*The pupil will derive much advantage from a careful study of such works as Lavater's "Physiognomy" and Bell's "Anatomy of Expression."

nize physiognomy, excel on that account in the art of portraying character in their busts. By certain strokes they can heighten those qualities for which the character is noted. This art can not be conveyed in writing, it can be acquired only by attending to physiognomic indications while we are engaged in the clay. A little experimenting with this object in view will be advantageous.

That the pupil may not adopt half measures by neglecting to attend to the shape of the head, under the impression that the face alone will answer the purpose of indicating character, I will here quote Lavater, that the importance of attending to the shape of the head may have more weight from being supported by an authority so pre-eminent. In his universally popular work on "Physiognomy," Lavater says, "I pay more attention to the form and arching of the skull, as far as I am acquainted with it, than any of my predecessors, and that I have considered this most firm and least changeable, and far best defined part of the human body as the foundation of physiognomy."

Having about me busts, executed by the first masters, of poets, composers, philosophers, states-

men, and generals, I find, from the biographies I have read of them, that the form of the head corresponds phrenologically in every particular to their known characteristics; and that marked proclivities are invariably accompanied by particular impressions upon the head.

Such then being my own experience, I can not but think that a knowledge of phrenology must be of advantage to those engaged in either painting or modeling portraits.

MODELING STOOLS, ETC.

At starting to model a bust in the absence of a modeling stool, some boxes should be arranged one upon another to such a height as to bring the work within easy access of the operator, so as to prevent stooping or overreaching. The boxes in which groceries are packed can be obtained of any family grocer. These are strong and most suitable for the purpose. The next requisite is a turn-table. This is made by two pieces of board about a foot or more square, to suit the size of the work, being placed one upon the other, the top piece to turn upon a pivot fixed in the

bottom piece. Six small sash rollers fixed equidistant in a circle under the upper piece will prevent the board becoming unmovable from the weight of the clay. The dampness of the clay will be apt to cause the turn-table to warp. This may be prevented by screwing two flat pieces together, with the way of the grain in the one piece going crosswise that of the other. The turn-table is then placed upon the boxes or stool, and upon this comes the flat piece of wood or board with a prop fixed to the center in a perpendicular direction.

HOW TO SUPPORT THE CLAY WHILE MODELING.

On the board and about the prop, the clay is then laid and worked up into a bust. This prop going up the center of the bust is to support the head and prevent it falling from its proper position. The prop should be about an inch shorter in height than the bust. If the lower part of the prop be of wood and the upper part of composition pipe, as used by gas-fitters, it will admit of the head being twisted or inclined in such direction as may improve the general ap-

pearance of the bust. The pipe should be fixed to the wooden prop by being bound round with thin wire. If string be used instead of wire it will give to the clay an unpleasant or musty smell. Where the entire human figure is being modeled without drapery or what otherwise would serve to support it, two props are necessary—one for each leg. These should be of iron, and bent, before fixing to the wooden base, in such direction as to admit of their coming within the center of the legs and body. After the supports have been properly placed they should be firmly fixed to the base so as to prevent the figure yielding to the pressure employed in working on the clay. Should any part of the iron protrude as the model progresses, it is better to leave it projecting than to distort the model by altering its form on purpose to cover in such part, as any prominence of this kind in the model may be easily removed from the plaster cast. It will make the props more firm by binding one to the other in the body where they should meet. One prop at least should go through the whole length of the figure. If the arms are not resting against the body, they

will need supporting; a piece of composition pipe inserted at the shoulders, and branching out in the direction the arms should take, will best serve for supporting the arms. Composition pipe may be easily bent, even with the clay upon it, should this be necessary; it will also admit of being cut through, which is convenient when the arms have to be removed for the purpose of molding the figure. This method of supporting the limbs in figures should be adopted when modeling in alto-relievo; that is, in those parts that would be in danger of falling off from want of such internal support. If the figure be draped down to the ground, a single prop going through the center as in a bust will be sufficient.

When animals are being modeled in a standing position, it is necessary to have a prop in each leg, each to be previously bent to the form, and placed in the position required. Leaden pipe is best for this purpose, as the lower ends may be easily flattened, turned up, and nailed down to the board. As the leaden pipe is not of itself sufficiently tough to support the body and to resist the pressure of working, a prop either of iron,

wood, or clay, should be introduced between the stand and the center of the body. In the plaster cast where iron rods are inserted in the legs, the center prop can then be dispensed with, and may be easily removed. When the center prop is used to uphold and fix the body, it will not be necessary to nail down the leaden pipe for the legs to the stand, and then, should the position of the legs be not quite right, it will be possible to shift or remove them.

HOW TO WORK WITH CLEANLINESS AND WITHOUT WASTE.

The model should not be carved from a solid block, but the clay should be laid on in pieces one upon another, and beaten together into the shape desired by means of a short stick. The tool for roughing out is then employed to remove the clay from those parts where there is too much, and to spread the same where there is insufficient, after the manner of spreading butter upon a piece of bread. The clay has a tendency to adhere to the tools and to accumulate thereon. Such clay as is found clinging to the tool while working should

be taken off and applied to the model where an addition may be needed. By this method of working, the clay will be economized and saved from falling and making a mess on the floor.

LIGHT.

If it is possible to choose the place for modeling, it is better where the light comes in from above than from the side.* When only a side light can be obtained, it will be necessary, after working on one side, to remove the model so that the light may fall on the other side, otherwise the likeness will be perceptible only under one particular light, and from only one point of view. A good portrait should strike from every aspect. When working by gas or candle-light, the position where the light can come down upon the front of the work is best. It is most safe, where possible, to vary the position of the light either by shifting the light or the position of the model.

*When side light only can be obtained, curtain the lower sash of the window, so as to let the light come from the upper portion of the window.

WORK BEFORE DETAILS ARE INTRODUCED.

As previously advised, it is useless to introduce details until the contour has been completed. This applies in every branch of modeling, and particularly in busts. As in map-drawing, if the counties are wrong, the introduction of towns and rivers will not make them right. Before introducing the mouth and eyes, the pupil should watch that the head is in proportion to the shoulders; that the width of the head is in proportion to its length. The nose may then be roughly indicated; after this, the ears, whose position at the sides of the head should be determined from the nose, as the position of the ears varies in different heads. In some cases the ears are situated farther back from the face than in others, and sometimes higher up than in others. The opening or orifice of the ear is, in some heads, in a line with the lower part of the nose; in others, it is as high up as the eyes. The place of the mouth should be judged of from the nose, and indicated near to or distant from the nose, according to the length of the upper lip. The

eyes, too, in some heads, are set nearer to the nose than in others, and sometimes more deeply. These differences should not be overlooked by the pupil who wishes to engage successfully in the art of modeling portrait busts.

Some busts are arranged to stand on their own base, as in term or block busts which terminate before reaching the outer ends of the shoulders. Shoulder busts, in which the arms are partly represented, would look squattish if left to rest on their own bases; their appearance is improved when such busts are elevated upon a plinth or stand. Most of the antique busts are mounted on a round stand, something of the ogee or torus pattern. It is usual to model the bust without this stand, and to mount it on a stand after it has been cast in plaster. The stands may be had ready made.

DRAPERY.

In modeling draped figures, much attention is needed in the proper arrangement of pleats and folds. In drapery, one particular fold necessitates another, where a graceful consistency is maintained, as much as a given position of the arm necessitates

a particular disposition and elevation or contraction of its different muscles. The best draped studies are found in casts from the antique sculptures. In these the folds or pleats are represented by straight rather than by curved lines. Even where a fold assumes a circular form, it is effected in the best models, not by curved, but by broken

Fig. 6.



VENUS DI MILO.

straight lines (Fig. 8). I have somewhere read something about the line of beauty consisting of

curved lines, but the engravings intended to illustrate this seemed, to me at least, unnatural in the extreme, and altogether inartistic. If it be a rule that beauty consists of curved lines, I can not think that it applies to drapery. The zigzag strokes which occur in rough or unfinished sketches, whether drawn or modeled, have an artistic effect which is often lost, or made to look mechanical, where rounding off or high finish is attempted. In modeling, mere indications have often a more artistic effect than a studied roundness. I do not know that any fixed rules on this matter are recognized by the great masters, the knowledge of which might save students from groping in the dark, but it has been my own experience to find that running lines, whether curved or straight, exist only in inferior work, while in the works of the best masters, they are carefully broken up, and arranged in such a manner as to avoid an offensive repetition. What is here said, with regard to drapery, applies equally to the hair, where balance should be maintained, but repetition avoided.

In producing original models of draped figures it is usual, even among experienced sculptors, to

clothe a lay figure and then to copy the same. Some artists are so particular with regard to their model, in fixing the attitude and in arranging the folds of the dress so as to fall gracefully, as to spend several days thereon before they commence to copy it. And being aware that each kind of fabric has its own anatomy or physiognomy, they will provide for their model silk, satin, or whatever material they wish to represent in their work. This method I shall here recommend as furnishing the best and most safe rule to adopt to guard against the errors that may be made in modeling drapery, especially since each different attitude of the body determines its appropriate folds in the dress.

ANATOMY.

Previous to starting on the entire figure I would recommend learners to begin with models of the the hand and foot. Casts of these are plentiful, and may be had in various positions.

In modeling the human figure a knowledge of the external muscles will be of great advantage. This may be gleaned from anatomical figures (Fig. 7). Plaster casts of these ranging about two feet

high, are obtainable. There is a very fine reduction about this size, by Flaxman, of the Gladiator, which is most useful in the study of figure draw-

Fig. 7.



ANATOMICAL FIGURE.

Fig. 8.



FIGHTING GLADIATOR.

ing or modeling. In schools of art this is a favorite subject to copy (Fig. 6).*

*It is very essential that the pupil who desires to excel in modeling the human figure should study the subject in

PROPORTION.*

In well-proportioned figures, it is usual to find the length of the body from head to foot to be about eight times the length of the face measured from the lower part of the chin to that part of the forehead which forms the boundary between the organs of the intellectual faculties and those of the moral sentiments. The length of the hands bears a certain proportion to the fore-arm, and this to the arm from the elbow to the shoulder. The foot is in length shorter than the leg from the ankle to the knee joint, and this is shorter than the leg from the knee to the hip.

An idea of the proportion which the limbs bear to each other may be inferred from the following such works as Dr. Fau's "Elementary Artistic Anatomy," or his larger work, "Anatomy of the External Forms of Man," or Marshall's "Anatomy for Artists." He will derive great assistance from the admirable plates with which these books are illustrated.

* Consult Marshall's "Rule of Proportion for the Human Figure."

numbers, which appertain to a figure measuring five feet ten inches from head to foot :

From ground to ankle	2 inches	7 eighths.
From ankle to knee	18	“ 0 “
From knee to hip	19	“ 2 “
From hip to collar-bone	16	“ 6 “
From collar-bone to top of head	13	“ 1 “
Length of foot, from heel to toe	10	“ 5 “
Hand, finger-end to wrist-joint	8	“ 3 “
Wrist-joint to elbow-joint	10	“ 0 “
Elbow to shoulder	12	“ 0 “

These numbers apply to casts from antique models of the most symmetrical kind ; and for the reason that such models convey the best information, they are now adopted in every school of art as the most useful studies ; and as therefore the foregoing numbers indicate what have been regarded, in both ancient and modern times, as the most perfect proportions of the limbs of the body, they may now be adduced as a standard or rule, by the observance of which the student may avoid errors with regard to the proportion which the limbs bear to each other, the body, and to the entire length of the figure.

DISPROPORTION.

It is difficult to lay down rules relating to Nature's handiwork to which she does not furnish exceptions, for we frequently meet with persons whose proportions will in no way fall in with the measurements given above. Some have bodies so long and legs so short as to be in a degree even painful to behold. I have seen persons with arms so short as to resemble much the appearance of a kangaroo, and others with arms so long as to appear like those of the gorilla; some with a giraffe-like length of neck, and others with legs so long, compared with the body, as to suggest the figure of an ostrich. Although such diversities show that Nature is not restricted by any bounds, they, nevertheless, do not excite that appreciation which we feel for what is intuitively regarded as perfect. What, therefore, is inappreciable, not to say objectionable, in Nature should be sedulously avoided in art; while the importance of observing just proportions will be self-evident.

To render applicable the foregoing measurements

to figures of any size, I now propose the following easy method for securing correct proportions :

METHOD OF MEASURING TO SECURE CORRECT PROPORTIONS.

Cut a stick of wood the same length as the figure intended to be modeled, whatever its size may be; mark off the same into twenty-four *equal* parts, then number each part in regular order from end to end. (Fig. 9.)

Number 1 marks about the ankle-joint from bottom of foot.

"	7	"	"	knee	"	"
"	13½	"	"	hip	"	"
"	20	"	"	shoulder	"	"
"	24	"	"	top of head	"	"

Length of foot about 3½ parts.

Long finger-end to wrist-joint 3 parts.

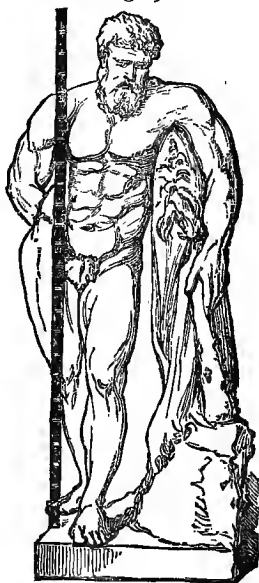
"	"	elbow	6½	"
"	"	shoulder	10	"

Length of face about 2¾ or nearly 3 parts.

The head varies in size according to the character represented in the figure. Where physique is the predominating quality, as in athletes, the head will be small compared with the body. Where mind is in the ascendency, as in able statesmen and philos-

ophers, the head is larger and forms the most attractive feature. The female head is smaller than the male head. To measure the body, therefore,

Fig. 9.



HERCULES.

by lengths of the head, is a method, though common, by no means infallible. The head in children is much larger, compared with the body, even than in statesmen.*

* The fact that the head is larger in children than in adults, compared with the rest of the body, was pointed to

PROPORTION IN CHILDREN.

The body is longer in the child than in the adult figure, to which alone the foregoing measurements apply. The growth is greater in the limbs during youth until manhood.

The method herein proposed for measuring the proportion of the limbs applies equally to slim or thickly-set figures; accordingly there can be no settled or fixed measurements employed to decide

by anti-phrenologists as being opposed to the phrenological theory. In answer to this, I beg to state, that even if it were a principle in phrenology, which it is not, that the size of the head, *compared with that of the body*, decided the amount of mental power, the doctrines of phrenology would remain unaffected by such an objection; for, though the head of the less intelligent child is larger than that of the more intelligent man, it should be remembered that the brains of infants are more taxed than those of adults. The child is ushered into the world as a stranger, but what is stranger still is the world to him, for he knows nothing of it, nor of anybody about him. About the "earth and the fulness thereof" he has every thing to learn. He at first perceives objects, he next learns to distinguish and remember them, and after much floundering about, he directs his

what should be the width or circumference of the chest compared with the height of the figure. In the male figure the circumference of the chest should be greater than that of the loins or about the hips, while in the female figure this order is nearly reversed (Fig. 10). In Nature there are exceptions to this rule which should be studiously avoided as models to work from.

tiny hands to reach them. *Every movement thus made is the result of brain-work, although to all appearance performed mechanically and without consciousness; for when the nerve is severed which connects the limbs with the brain, all such movements cease.* Before the child can walk he has to learn to balance himself, and, during this lesson, he often gets a hard thump for the slightest mistake. In short, he has to learn many rudiments, a task much more difficult than their application. It is the first part of life's business that is most difficult. The child has a larger head than the man, admitted; and the largest amount of mental taxation to endure, indisputable. Let this settle the matter. As it is upon phrenological principles that I take my standpoint in directing the pupil through these pages, I hope to be excused for this digression.

CONFORMABLENESS OF THE BODY TO THE HEAD.

Just as the head and face are expressive of the character, so will the whole body bear a general correspondence to these, and is, necessarily, as a

Fig. 10.



VENUS DI MEDICI.

consequence, indicative of character also. Indeed, there is an unswerving relationship of the head to the body down to the very finger-ends. With

the feet and body of the hawk we need not the head to know them to be of a rapacious creature. Here is a law which, if observed, will save the pupil from joining parts which nature repudiates without exception. How ridiculous it would seem if the nervous and philosophic head of Voltaire had been placed upon the body of the Farnese Hercules—a head of the most delicate lineaments on a body of full-blooded muscle.

I give it upon hearsay, that a naturalist of high repute, on being furnished with a single bone of an unknown animal, drew the entire skeleton, and when the drawing was compared with the entire skeleton, which was afterward found, the resemblance was perfect.

If a single bone bears about it characteristics by which the naturalist is enabled thus to determine its place, the number and relative proportions of the bones composing the entire skeleton, it leaves no doubt whatever of the existence of a relationship between the different parts of the same body; bearing, as it were, a sort of family likeness, one to the other, while the fact distinctly points to the existence of a law (fixed principles in Nature), the

knowledge of which would materially assist both the painter and sculptor.

Even at the present time there seems to be a deplorable ignorance among artists of those principles, the knowledge of which supplies the man of science with so unerring a guide. Even the Royal Academician is found guilty of combining incongruities, by placing the head of a profound and deep-thinking philosopher upon the body of a gaunt slouch.

In Nature, where the head is expressive of delicacy and refinement, we find the same conveyed by a delicacy of form throughout the entire body, even to the folds of the dress. Take the sporting gent on the morning of the race, his face is full of life and animation, his gait is light and active; but behold him at night, with eyes bleared, countenance fallen; does his body retain its morning's elasticity? No! like his face, it has a downward hanging. Even his dress, so prim in the morning, is now, like the body within, dull and heavy.

In heraldry, where we meet with various combinations, the savage is not joined to the docile creature. The griffin, with its eagle-like head, is

not supported with the legs of the gazelle, but upon sinuous claws; even the wings and tail are forked, and convey the fierceness expressed in the

Fig. II.



THE GRIFFIN.

head. The sluggish pig's head is never joined to the graceful neck of the swan. In the legions of fabled monsters such digressions are not admitted which artists frequently commit, in ignorance of the law which invests every part of the animal system with the same characteristics.

If the ancients were not possessed of any systematized theory on the subject, they seem, at least in their sculpture, to have observed such a law. The statue of Apollo, which is so much

admired for its symmetrical proportions, shows the face to be almost expressionless, and this quality is conveyed throughout the whole body by its smooth and unbroken surface. The fighting gladiator, on the body of which every external muscle is markedly shown, is much more attractive on this account, and though its character is only that of an athlete, the head is quite in conformity with this, showing a fullness at the lower part of the forehead, indicating a suitability for grappling with physical difficulties, but wanting in that height usual in those who engage in refined and philosophic studies.

PHRENOLOGY, ITS AID IN MODELING.

It may appear presumptuous to those who are prejudiced against phrenology, but it is my own opinion that the pupil who aims at perfection in the art of modeling will do well to attend to the principles propounded by the phrenological theory. I do not mean to imply that a knowledge of scientific principles alone will constitute an artist, but aided by such knowledge the pupil will be enabled to anticipate the result of each stroke with a degree of certainty which will bring him to a state

of proficiency that goes a long way toward making him a master of the art of modeling. It will inspire him with a confidence which will make his strokes masterly ; but, unguided by such knowledge, however expert in the use of the tools, his work may be well done, but look blank and meaningless. It is not the man who writes the best hand that pens the best essay. That man who can only scrawl, but understands his subject, will carry the palm. The rough-hewn works of Michael Angelo are not improved upon by the highly-finished productions of the amateur.

But some are so insensible to human nature, that any reference made to character is, to such, as futile as an oration delivered to the deaf, or as an essay on colors to the blind.

There is not a single object in Nature which, in its outward form, does not bear physiognomic indications of its internal nature.

In the vegetable kingdom there are thousands of plants possessing each a particular medicinal property. It is by the form and general appearance of each that the botanist knows to distinguish these. This has to be done with a degree

of certainty to make them useful for pharmacopial preparations, on the quality of which human life often depends. It is well known that many wholesome plants have their spurious prototypes, which, when mistaken for the genuine, prove very injurious. In cases of this kind, although the resemblance is so great, there is a difference by which any one experienced in such matters can distinguish the good from the bad.

In mankind, such resemblances are not uncommon, and require an experienced judge to know the gentleman from the dissembler; and while such differences are to be distinguished by such slender shades, the artist can not be too wary of them, nor should he consider that time but as well spent which will lead him to a knowledge of those principles by which he may guide his strokes to a desired end; for should he produce any thing good without such knowledge, either inherent or acquired, it will be the result more of chance than art, and he can have no dependence on himself.

Phrenology points not only to forms and proportions in deciphering character, but in the name of "temperament" it directs the attention to consti-

tutional conditions, which decide the quality of the bulk. This is an item which the artist, understanding his business, will not allow to be passed over as unimportant. He will then know that it will be but spoiling his work to engage upon a sitter whose face, from indisposition, is flaccid and inanimate. Grief, or a slight cold, will sometimes obliterate, for a time, the delicate lineaments of the face, and make it look inert and dead. Cases of this sort have been known sometimes to disgust persons with their own appearance. The artist, seeing from this the important part which these fine chiselings form in portraying character, should not fail to insert them in his work when his model demands their presence, nor fail to represent them correctly lest the least deviation should alter the expression. By a knowledge of the temperaments the artist will understand that a feature insufficiently developed in proportion to the rest of the face will make that part look weak, while an excess is likely to give the part the appearance of being diseased.

Should the pupil be unable to appreciate this, and still wish to become a sculptor, I would advise

him to turn from living subjects and choose dead ones, such as monuments and tombstones. Here I shall leave the pupil to himself, who must not forget that continued practice, and not theory or books, will make the artist.

TO CAST CLAY MODELS IN PLASTER.

To make a mold from the clay model, and to make a plaster cast from the said model, is an art distinct from that of modeling. When a model has been sufficiently well executed as to be worth reproducing in plaster, it is most safe to employ a professional molder to do it. In the best hands it is very risky work, and in most cases the plaster cast has to be retouched by the artist. Clay models should be molded as soon as possible after they are finished, because if left to dry they crack and lose much of their original character. Where it is inconvenient to call in a molder, and the modeler, on this account, is anxious to do the molding, a few hints on this art may be found useful.

To make a plaster cast from the clay model, say a bust, a *mold* is first made in two parts. To accomplish this, the model has first to be specially

arranged, by placing a band or ridge of clay around the head after the manner of the rim of a hat, about the back part of the head rather than at the top, after the fashion that hats are worn by sailors. A thin layer of plaster is then carefully thrown about the bust, until the part below the rim is thoroughly covered right up to the edge of the clay margin, avoiding, as much as possible, the plaster splashing on to the model above the clay ridge. The quantity of plaster to be mixed for this purpose will depend on the size of the model, and must be judged of by the operator. In mixing the plaster for the first layer, some water, about sufficient for the purpose, is poured into a basin sufficiently large to admit of mixing. The water is then tinted by throwing in a little dry Venetian red or yellow ochre as supplied by color-men in powder. After one or other of these colors has been well stirred into the water by means of a spoon, the plaster is then lightly but quickly sprinkled in until it is seen rising nearly level in all parts with the surface of the water; it is *then* stirred up, and not *before*, and without delay applied to the model by throwing on with the hand

or a spoon, whichever is found to answer best. This should be done expeditiously, for plaster when mixed, like "time and tide, waits for no man." The plaster should be used while in a thin fluid state, for, if applied when it becomes thick or stiff, it will impress or distort the model.

After the first layer of tinted plaster, about the thickness of two or three penny pieces, is on, it should be slightly sprinkled with a little clayey water, that is, water with a little clay stirred into it, about sufficient to give it a milky consistency. This is used to serve to separate the first thin tinted layer of plaster from the second thick white layer which follows. After the first layer has been sprinkled with the clay water, it has then to be covered with another layer of plaster mixed as the previous one, but without color, and spread on about half an inch or more in thickness all over. Large models require the mold to be thicker than small ones for fear of a collapse while working. When this part of the mold has been made sufficiently strong or thick, the clay band or rim is next carefully removed from around the head, and any roughness about the margin of the mold,

formed by the clay band, should be carefully cut away, and four or more sloping notches cut equidistant in the margin of the mold, which is then brushed over with clay water; then a thin layer of tinted plaster is applied to the uncovered part of the model, extending right to the outer edge of margin of the first part. This is sprinkled with clay water, and then covered with a thick layer of uncolored plaster, as in the previous part of the mold. The mold has now to be sprinkled with water (not clayey), until it is thoroughly saturated and shining with wetness. Plaster, even when recently mixed, is, as soon as it is set, very porous and absorbent, and requires a deal of sprinkling, or soaking, where possible, to sufficiently saturate it. Any superfluous plaster that may be overlapping where the mold should separate, should be removed by cutting away. The top piece of the mold is now to be pulled off: should it resist, it may be pried, at the opening, with a chisel at different points. When the top piece is removed, the clay model is then carefully withdrawn from the interior of mold piecemeal. Whatever instrument is found best for this purpose may be used. It is

best to clear the clay from the middle of the model, until it gets thin enough to bend away the rest remaining on the interior of the mold. In getting the clay out, some care is necessary to avoid notching the interior of the mold, for any impressions thus made will produce corresponding defects in the cast; although these may be easily remedied, it is better to save this trouble by a little previous care. When every particle of clay has been removed, the mold should be carefully washed throughout the interior with a limp haired brush. When thoroughly washed the mold should be left to drain for a while, and then washed with soft soap reduced to a creamy consistency with boiling water, about a pint and a half to a half pound of soft soap. It is best applied with a brush as when shaving. After the interior of the mold has been well brushed all over, some sediment of the soap will remain on the surface, but this must be all carefully brushed out, but no water to be used for this purpose. When thus prepared the top piece is to be replaced and bound down firmly with cord. The exterior should now again be well saturated with water. A layer of plaster,

mixed as previously advised, without color, is now thrown in and shaken all over the interior of the mold. Other layers are to follow this in quick succession until the cast becomes thick enough.

In twenty minutes after throwing in the last coat of plaster the cast should be sufficiently set to remove the mold therefrom. With chisel and mallet the exterior mold is gently chipped away from the interior tinted layer, which is next removed by being picked off with whatever kind of tool is found best for the purpose—one flat, pointed, and slightly curved at the end, is mostly used. The cast may now be finished at leisure.

In making casts from full-length figures the same method is employed, excepting that the clay band, used to form the separation in the mold, is made to extend from over the top of the head, down the sides toward the back, right to the base, so as to form a sort of back and front to the mold. In molding masks or relievos one piece will be sufficient, without making the mold in parts. Should the mold break into pieces before the cast is made, the pieces should be put together accurately and fixed with plaster on the outside.

The first layer of tinted plaster should be thrown into all the interstices, so that every part of the model be covered by it. The tinted plaster is used to distinguish the mold from the cast, so as to guard against chipping beyond the one and into the other, of which there would be great danger if the mold was not thus distinguished from the cast.

This method of casting models is known as waste-molding, probably because the mold is destroyed in getting out the original cast.

Where the arms, or other parts of a figure, extend away from the body, it is usual to cut these off, and to mold and cast them separately. Undraped figures, standing with only their legs to support them, should, when being cast, have rod-iron inserted in the legs to strengthen them. The iron should be previously cut to the proper length, and then bent to suit the curves of the legs. This is best done by fitting to the mold previous to preparing, and tying it up for casting. The iron is put in through the opening at the base as soon as possible after the plaster has been thrown in. The iron should be bent up at the bottom end, to pre-

vent it slipping away through the legs into the body, otherwise its purpose will be lost. The iron, by being thus bent into the stand, will add to the strength of the figure. The arms should be strengthened in the same way, with the iron jutting a little way out where the arm joins the body. The part jutting out, by being let into a hollow purposely made in the body, will make the joint more secure. Where plaster casts have to be joined up from being made in parts, the parts to be joined should be hollowed by cutting inward; the hollows are then to be well wetted, filled in with plaster, put together, and held firmly until set. The plaster that oozes to the surface, as it should for the joint to be a firm one, is then to be carefully scraped away. The iron used for strengthening the casts, after it is cut and bent to the length and shape required, should be made hot and rubbed all over with common sealing-wax. This will prevent it rusting, and staining the cast with iron-mold.

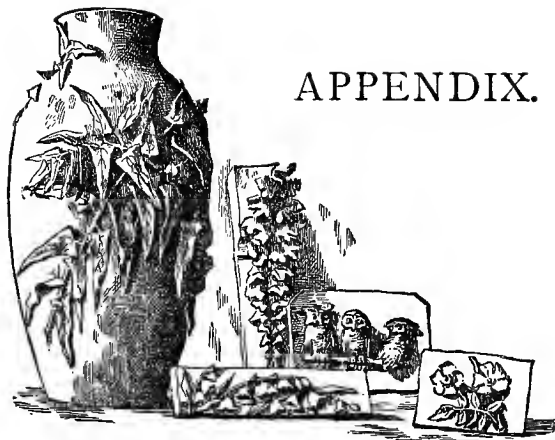
The art of making *piece molds*, from which a number of casts may be produced, requires almost an apprenticeship to learn, and consequently can

not be acquired theoretically. From such molds impressions in clay may be taken, and terra-cotta copies repeated when clay specially prepared for such work is used. Such impressions, or clay squeezes, as they are otherwise called, require some trimming-up after leaving the mold, and must be allowed to get thoroughly dry before being submitted to the kiln for baking.

The original model may be done in terra-cotta clay, and if built up hollow may be baked, and so preserved without being cast in plaster.

To make a waste mold and cast will be found much more easy to read about than to do, especially by those who have never seen such work done. A practical lesson would save a deal of bungling.





APPENDIX.

ON MODELING FOLIAGE, ETC., FOR POTTERY AND ARCHITECTURAL DECORATION.

For technical discipline, and for decorative purposes, modeling in clay has a use and importance not generally recognized. A great variety of interesting and original plastic work is within the reach of almost every intelligent observer of nature's instructive forms. Those who would carve, with effect, in wood or stone, or work in metal, will find modeling in clay a necessary and time-

saving preliminary. Those who live within reach of a pottery, where their work may be fired, have a means of giving permanence to their attempts by some of the lustrous glazes now attainable, or by metallic and earthen pigments, and subsequent transparent glazing, that will make their work a delight to the eye and the mind. The art student who aims to re-present, or even suggest, nature's infinite freedom and charm, thereby avoiding lifeless, wooden, and unmeaning forms, must first use the plastic, helpful, obedient clay. Drawing teaches us to observe; modeling makes us know. In modeling, the sense of touch is exercised in conjunction with that of sight, and forms are readily memorized, which would be likely to escape if they were only drawn.

WHAT TO MODEL.

Art work that does not appeal to the judgment and the imagination is of little value, and need not be encouraged. The student is therefore advised not to commence by modeling an old boot (see page 14), unless it has a history, or has been through a campaign. Any one of a dozen differ-

ent kinds of large leaves will afford equally good discipline for eye and hand, and the recognition of beauty and life in the form of the leaf will be a healthful stimulus to the mind, while the skill attained in the careful modeling of one leaf will be of service in the attainment of natural effects in all other plant forms. The leaf, too (supposing it to be a holyhock), if fired and glazed, may serve the purpose of a fruit dish, and possibly become a thing of use as well as of beauty, which an old boot, however carefully reproduced, never could be.

Among the subjects which the student may select for his first attempts in modeling, are such leaves as the burdock, grapevine, geranium, holyhock, magnolia, and many large-leaved weeds of striking outline and beauty. Some of these, with or without stems for handles, make interesting and useful objects for firing. Next take groups or sprays of leaves, selecting such as present a waved surface and striking outline, and avoiding those which are too highly serrated, or have too level a surface. Most interesting studies are furnished by sprays of leaves and blossoms, such as the wild rose, dogwood,



apple, quince, and syringa, avoiding, at first, double blossoms and trumpet and funnel-shaped flowers, or such as do not readily admit of treatment in low relief. The student may then take compound leaves, as the Virginia creeper, ferns, ailanthus, locust, wisteria, etc., or such fine and striking forms, for decorative purposes, as the genus solanum or the wild parsnip. Butterflies, dragon flies, lizards, frogs, bats, etc., may be introduced, if space and subject permit. Birds may then be attempted, in half or still higher relief. The student is advised not to attempt copying the minute details of flowers. The representation of the stamens and pistils of the wild rose, for example, need only—indeed, can only—be generally

approximated. Leaves, sprays, and flowers may be arranged for copying, so that their stems may reach water in a phial, laid obliquely. An unchanged model may thus be secured for one or two sittings. It is not so much, however, the exact or servile copying of any one leaf, as to either form or position, as the general or distinctive expression of form and growth, that the student should seek to represent in his work.

TOOLS.

The principal tools used in modeling are the fingers and thumbs. For surfaces and interstices that can not be thus reached, three kinds of modeling tools are used: 1. Tools with a chisel edge, either square or oblique; 2. Tools with a convex edge or point; 3. Tools with a concave edge. They can usually be obtained of dealers who furnish artists' materials, or they may be made by the ingenious student himself, from any hard, close-grained wood, such as the roots of black walnut, box, ebony, or persimmon. The best tools are made from cocoanut wood; their close, satiny surface prevents the clay from sticking, and their very

touch is a pleasure. Modeling tools are from six to eight inches long, swelling toward the middle, which should be oval (5-16 x 7-16 inches), so that they can be conveniently and firmly held in the required position by the thumb and first two fingers. After the wood is roughly sawed to the shape, the tool may be brought to the desired form by means of a wood rasp. It is then smoothed with a scraper, or the cutting edge of a piece of broken glass. Afterward, it is rubbed with fine sandpaper, and finished by burnishing it with any smooth, convex steel instrument.

A wet sponge is necessary, for occasionally cleansing the fingers, to avoid the drying of the clay, and its consequent crumbling over the work. After each sitting, wet cotton cloths must be placed over the work. It is immaterial whether they touch it or not, so that the air is excluded, and the clay kept in fitting condition for the student to resume work. A spray blower, an ingenious contrivance used by cigar makers, called an "atomizer," by which a fine spray may be blown over the work, when necessary, will also be needed.

METHOD OF WORKING.

Modeling clay, which is sifted and free from grit and impurities, can be obtained at almost all potteries. Its price is about two and a half cents per pound. For the modeling of small subjects, such as a spray of leaves or flowers, it is necessary to procure a piece of slate or wood. Upon this is modeled a rectangular slab of clay, an inch or more in thickness, on which the subject to be modeled will rest, and by which, when dry, it will be lifted. The slab is brought to the required shape by adding piece after piece of clay, kneading and pressing it with the fingers, making a perfect adhesion with the added pieces, and avoiding air holes. The slab may be smoothed and brought to a uniform thickness by laying two narrow pieces of wood, of even thickness, at the edges, and then drawing a straight-edge or a piece of fine wire across the surface. The edges may be trimmed square with a knife or the thin edge of a modeling tool.

On this slab, the student may now proceed to model a leaf, by building up and pressing into po-

sition small pieces of clay, until he has roughly reproduced, in size and shape, the leaf which is before him. He should then carefully mark, with a pointed tool, the outline of the intended leaf, after which he may cut away the superfluous edges; then wave the surface to accord with the model, gradually bringing it to the required smoothness, marking veins, etc., and finally undercutting the edges, so as to avoid the appearance of unnecessary thickness.

If a single leaf of large size is to be modeled, especially if it is to be fired for a dish, it does not need to rest on a slab, but may have a portion of its under surface—say to the extent of about one-third of its diameter—flattened to form its base. If the edges of the leaf are thin, and project more than an inch or two, they may require to be supported by short sticks of clay, which can be removed as the material dries.

In modeling a study of leaves, such as a spray of three or four oak leaves, and a bunch of acorns, the slab should be somewhat larger than the subject. As the student builds up his copy, with the model directly before him, adding little by little

to the shape he is developing, he must be careful that each addition blends, without leaving air holes. Only when the desired form is approximated, need he use his tools to bring out each detail to his satisfaction.

MODELING ON PLAQUES AND VASES.

An exceedingly interesting kind of work, and one which will be practiced more and more, as facilities are afforded to the art student, is modeling on plaques, vases, tiles, etc., with the same or different colored clays. This work is done on the raw clay, usually about a day after the object has been molded. Foliage, flowers, butterflies, birds, conventional lines of ornament, etc., afford never ending subjects for decorative treatment. To insure the best results, this work should be done at the pottery. Modeled work may be painted on the green clay, or it may be fired and afterward painted or glazed with colors of exceeding richness.

MODELED WORK FOR ARCHITECTURAL DECORATION.

An extensive field for the employment of modeled work is opening up in architectural decoration, especially for structures where pressed brick is the building material used. The clay used for this purpose is called *terra cotta*, and produces a harder and more enduring material than any other known clay, or even stone. Terra cotta is produced by a combination of potters' clay, fire clay, white sand, alkalis and ground potsherds, producing a homogeneous mass which partly vertifies in the process of burning, and requires no after glazing to make it practically indestructible by time, fire, or frost. Modeled tiles, to form panels for insertion above or below windows, decorated caps for doors and windows, brackets, and string-course lines of decoration, are among the uses to which this admirable material may be applied, and which will enable the skilled amateur to obtain for his home original decoration, which might be quite beyond his means, were it to be cut in stone.

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